

CLAIMS

I/we claim:

1. An antiperspirant cosmetic stick formulation comprising:
 - (a) from about 25% to about 55% of a volatile material;
 - (b) from about 5% to about 35% of non-volatile liquid emollient(s);
 - (c) from about 0.5% to about 15% of non-liquid organic ester emollient(s) having melting point(s) between about 25°C. to about 60°C.;
 - (d) from about 5% to about 20% of organic wax base(s) having low melting point(s) or high melting point(s) or mixtures thereof;
 - (e) from about 0.05% to about 5% of low molecular weight polyethylene homo- or co- polymer; and
 - (f) from about 15% to about 30% of a particulate antiperspirant active agent.
2. The formulation of claim 1 wherein said volatile material is a volatile silicone.
3. The formulation of claim 2 wherein said volatile silicone is a cyclomethicone.
4. The formulation of claim 3 wherein said cyclomethicone is predominantly cyclopentasiloxane.

5. The formulation of claim 1 wherein said non-volatile liquid emollient (b) is selected from:

- i. a (branched or straight chain) C_{6-10} alkyl (branched or straight chain) C_{6-10} alkanoate;
- ii. a $RCOO(C_{2-3}H_{4-6}O)_n OCR^1$ compound where R and R^1 are each independently selected from the group consisting of C_{13-21} alkyl;
- iii. a $RCO(C_{2-3}H_{4-6}O)_n H$ compound where R is a straight or branched chain alkyl of from 2 to 6 carbons;
- iv. an aryl methicone and;
- v. mixtures thereof.

6. The formulation of claim 5 wherein said non-volatile emollient (b) is selected from the group consisting of octyl isononanoate, polyethyleneglycol-8 distearate, polypropyleneglycol-14 butyl ether; and phenyl trimethicone.

7. The formulation of claim 5 wherein said non-volatile emollient (b) comprises at least octyl isononanoate, polyethyleneglycol-8 distearate, polypropyleneglycol-14 butyl ether; and phenyl trimethicone.

8. The formulation of claim 1 wherein said non-liquid organic ester emollient(s) (c) is selected from (a) $R^2O(O)CR^3$ compounds, in which R^2 is (branched or straight chain) C_{14-22} alkyl and (b) glyceryl triesters where the acyls have a total number of carbons of from 27 to 39 carbon atoms.
9. The formulation of claim 8 wherein said non-liquid organic ester emollient(s) (c) is selected from isostearyl behenate, octadecyl propanoate, arachidyl propionate, cetyl ricinoleate, and glyceryl triundecanoate.
10. The formulation of claim 1 wherein said high and low melting point waxes of component (d) are selected from (i) high melting point waxes selected from beeswax, montan, ozokerite, ceresin, paraffin, synthetic waxes, and hydrogenated castor oil; (ii) low melting point waxes selected from fatty alcohols.
11. The formulation of claim 10 wherein said high melting point wax is hydrogenated castor oil and said low melting point wax is stearyl alcohol.
12. The formulation of claim 1 wherein said low molecular weight polyethylene homo- or co- polymer (e) is selected from the group of homopolymers of ethylene, copolymers

of ethylene and propylene, copolymers of ethylene and maleic acid or maleic anhydride, oxidized polyethylenes, and ethoxylated polyethylenes.

13. The formulation of claim 12 wherein said low molecular weight polyethylene homo- or co- polymer (e) is a polyethylene homopolymer.
14. The formulation of claim 12 wherein said low molecular weight polyethylene homo- or co- polymer (e) has a weight average molecular weight (M_w) and a number average molecular weight (M_n) independently of not more than about 1000, and a M_w/M_n of about 0.9 to about 1.3.
15. The formulation of claim 12 wherein said low molecular weight polyethylene homo- or co- polymer (e) has a weight average molecular weight (M_w) and a number average molecular weight (M_n) independently of about 400 to about 500, and a M_w/M_n of about 1.1
16. The formulation of claim 1 wherein said particulate antiperspirant component (f) is selected from aluminum-zirconium tri-, tetra- and penta-chlorohydrate glycine complexes, aluminum chlorohydrate, and aluminum chloride.

17. The formulation of claim 16 wherein said particulate antiperspirant component (f) is aluminum-zirconium tetrachlorohydrate gly.
18. The composition of claim 1 further comprising at least one material selected from surfactants, inert fillers, bacteriostats, and fragrances.
19. The composition of claim 18 wherein said inert fillers are selected from corn starch, talc, fumed silica, inorganic clays, and mixtures thereof.
20. An antiperspirant composition comprising
- (a) about 25% to about 55% cyclopentasiloxane;
 - (b) about 5 to about 35% of non-volatile liquid emollients selected from octyl isononanoate, PEG-8 distearate, PPG-14 butyl ether, and phenyltrimethicone;
 - (c) about 0.5% to about 15% of isostearyl behenate;
 - (d) about 5% to about 20% of a mixture of hydrogenated castor oil and stearyl alcohol;
 - (e) about 0.05% to about 5% homopolyethylene having a weight average molecular weight (M_w) of about 400 to about 500, a number average molecular weight (M_n) of about 400 to about 500, and a ratio of $M_w:M_n$ of about 1:1; and
 - (f) about 15% to about 30% of aluminum/zirconium tetrachlorohydrate gly.

21. An antiperspirant composition comprising

- (a) about 30.4 to about 33% cyclopentasiloxane;
- (b) (1) about 10% octyl isononanoate;
 - (2) about 2% PEG-8 distearate;
 - (3) 0% to about 5% PPG-14 butyl ether, and
 - (4) about 5% or about 6% phenyltrimethicone;
- (c) about 0.5% to about 7% of isostearyl behenate;
- (d) (1) about 4% hydrogenated castor oil; and
 - (2) about 12% to about 14% stearyl alcohol;
- (e) about 1% to about 1.5% homopolyethylene having a weight average molecular weight (M_w) of about 400 to about 500, a number average molecular weight (M_n) of about 400 to about 500, and a ratio of $M_w:M_n$ of about 1:1; and
- (f) about 22% of aluminum/zirconium tetrachlorohydrate gly.

22. The antiperspirant of claim 21 further comprising:

- (g) 0% to about 4.5% talc;
- (h) about 0.5% silica;
- (i) 0 to about 0.5% PEG-25 propylene glycol stearate; and
- (j) 0 to about 0.6% fragrance.

23. The antiperspirant of claim 22 which is selected from formulations 1, 2, and 3:

<u>Component</u>	<u>Formulation 1</u>	<u>Formulation 2</u>	<u>Formulation 3</u>
AlZr Tetrachlorohydrex Gly	22%	22%	22%
Cyclopentasiloxane	32.5%	33%	30.4%
Stearyl alcohol	12%	14%	12.5%
Hydrogenated Castor Oil	4%	4%	4%
Octyl Isononanoate	10%	10%	10%
Isostearyl Behenate	2%	7%	2%
Polyethylene	1%	1.5%	1%
Talc	3%	-----	4.5%
PEG-8 Distearate	2%	2%	2%
PPG-14 Butyl Ether	5%	----	5%
Phenyl Trimethicone	5%	6%	5%
Silica (Cab-O-Sil M5, Cabot)	0.5%	0.5%	0.5%
PEG 25 propylene glycol stearate	-----	----	0.5%
Fragrance	---	----	0.6%
Total	100%	100%	100%

24. A method of making an antiperspirant cosmetic stick formulation comprising:

- (a) from about 25% to about 55% of a volatile material;
 - (b) from about 5% to about 35% of non-volatile liquid emollient(s);
 - (c) from about 0.5% to about 15% of non-liquid organic ester emollient(s) having melting point(s) between about 25°C. to about 60°C.;
 - (d) from about 5% to about 20% of organic wax base(s) having low melting point(s) or high melting point(s) or mixtures thereof;
 - (e) from about 0.05% to about 5% of low molecular weight polyethylene homo- or co- polymer; and
 - (f) from about 15% to about 30% of a particulate antiperspirant active agent;
- comprising
- mixing, in any order, components (a) through (e) to form a mixture;
- heating said mixture until all of said components (a) through (e) are in liquid form;
- adding component (f) to said mixture in liquid form;
- allowing the mixture to cool and filling the mixture into containers.